

Name Key

Date _____

Ch 6 Review

Solve.

1. $(x+5)^2 + 25 = 0$

$x+5 = \pm 5i$

$x = -5 \pm 5i$

3. $x^2 + 8x + 6 = 0$

$$x = \frac{-8 \pm \sqrt{64 - 4(1)(6)}}{2(1)} = \frac{-8 \pm 2\sqrt{10}}{2} = -4 \pm \sqrt{10}$$

2. $(x-2)^2 = 12$

$x-2 = \pm 2\sqrt{3}$

$x = 2 \pm 2\sqrt{3}$

4. $2x^2 + 5x + 3 = 0$

$$x = \frac{-5 \pm \sqrt{25 - 4(2)(3)}}{2(2)} = \frac{-5 \pm 1}{4} = \left\{ -1, -\frac{3}{2} \right\}$$

Determine the nature of the roots. (without solving)

5. $2x^2 + 9x + 3 = 0$

$81 - 4(2)(3) = 57$

2 IR Irrat

7. $4x^2 + 2x - 110 = 0$

$4 - 4(4)(-110)$

1764

2 IR Rational

6. $3x^2 - 6x + 3 = 0$

$36 - 4(3)(3) = 0$

Double IR root8. Determine the value for k such that $3x^2 + 6x + k = 0$ has a double root.

$36 - 4(3)k = 0$

$36 = 12k$

$3 = k$

9. The height of a projectile is given by the following formula $h = 100t - 16t^2$.

What is the maximum height of the object? At what time(s) will the object reach 120ft? (Round to two decimal places.)

$$\frac{-100}{-32} = 3.125$$

156.25 ft

$120 = 100t - 16t^2$

$0 = -16t^2 + 100t - 120$

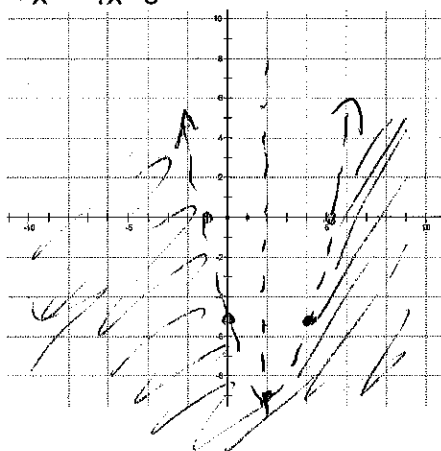
$$\frac{-100 \pm \sqrt{10000 - 4(-16)(-120)}}{-32}$$

$$= 1.62 \text{ sec or } 4.63 \text{ sec}$$

Just for fun.

10. Graph

a. $y < x^2 - 4x - 5$



$V(2, -9)$

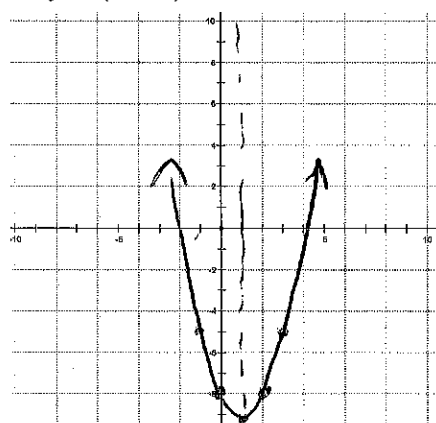
$x = 2 \text{ a.o.s.}$

$y = -9$

$(-1, 0)$

$(5, 0)$

b. $y = (x-1)^2 - 9$



$V(1, -9)$

$\text{a.o.s. } x = 1$

$y = -9$

$(-1, 0)$

Solve.

11. $2x^2 - 11x - 40 < 0$

12. $3x^2 - 4x + 8 > 0$

$$\{x \mid -2.5 < x < 8\}$$

TR

$V(-1, 2)$

Matching. Match the equation with the correct letter of the graph.

13. $y - 2 = (x + 1)^2$ c

$V(-2, 1)$

14. $y = -\frac{1}{2}(x + 2)^2 + 1$ d

$V(0, 2)$

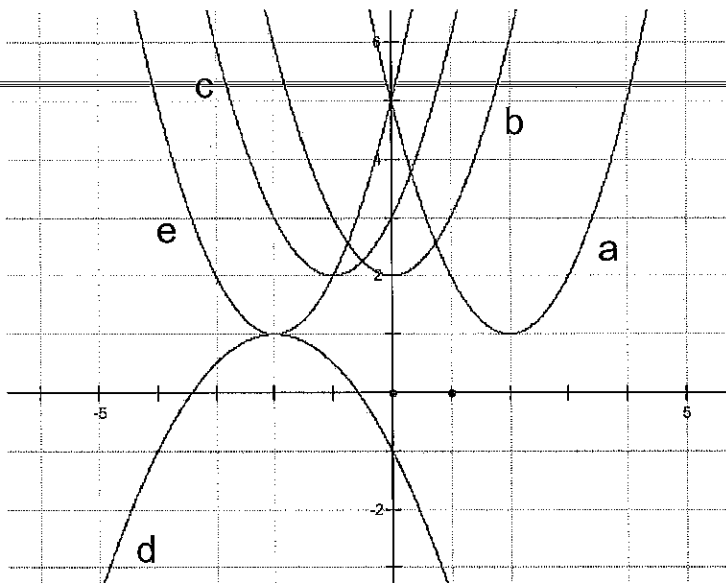
15. $y - x^2 = 2$ b

$V(-2, 1)$

16. $y = x^2 + 4x + 5$ e

$V(2, 1)$

17. $y = x^2 - 4x + 5$ a



Write the quadratic equation with the given roots.

18. $\{-3, -3\}$

19. $\{5, -3\}$

20. $\{4, \frac{3}{4}\}$

$x^2 - \frac{19}{4}x + 3 = 0$

$S = -6$

$P = 9$

$x^2 + 6x + 9 = 0$

$S = 2$

$P = -15$

$x^2 - 2x - 15 = 0$

$S = \frac{19}{4}$

$P = 3$

$4x^2 - 19x + 12 = 0$

21. $\{3i, -3i\}$

22. $\{5 + 3i, 5 - 3i\}$

23. $\{2 + \sqrt{5}, 2 - \sqrt{5}\}$

$S = 0$

$P = 9$

$x^2 + 9 = 0$

$S = 10$

$P = 34$

$x^2 - 10x + 34 = 0$

$S = 4$

$P = -1$

$x^2 - 4x - 1 = 0$

24. Find k , if one root is -4 for the equation: $2x^2 + kx - 12 = 0$.

$-4 + r = \frac{-k}{2}$

$-4 + \frac{3}{2} = \frac{-k}{2} \rightarrow \frac{-8}{2} + \frac{3}{2}$

$-4r = \frac{-12}{2} \rightarrow r = \frac{-6}{-4} = \frac{3}{2}$

$\frac{-5}{2} = \frac{-k}{2}$

$k = 5$

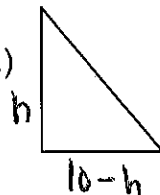
25. The sum of the lengths of the legs of a right triangle is 10cm. What is the maximum area of such a triangle? ($A = \frac{1}{2}bh$) (The height and base are the legs.)

$$A(h) = \frac{1}{2}h(10-h)$$
$$= 5h - \frac{1}{2}h^2$$

$(5, 12.5)$

12.5 cm^2

$h + b = 10$
$$b = 10 - h$$



$$\frac{-5}{2(-\frac{1}{2})} = 5$$